Weekly Report

10/13/2014-10/19/2014

Reserach

This week, I read a paper about mobile social networks[1]. In this paper, authors define an objective function , i.e.,$P_\alpha(Y, Z|G, X)$. They factorize the global probability as a product of local factor function by factor graph[2].
For example, let $g(x_1, x_2, x_3, x_4, x_5)$be a function of five variables,and suppose that $g(x_1, x_2, x_3, x_4, x_5)$ factors into a product of several local functions:

$$g(x_1, x_2, x_3, x_4, x_5) = f_A(x_1)f_B(x_2)f_C(x_1, x_2, x_3)f_D(x_3, x_4)f_E(x_3, x_5)$$

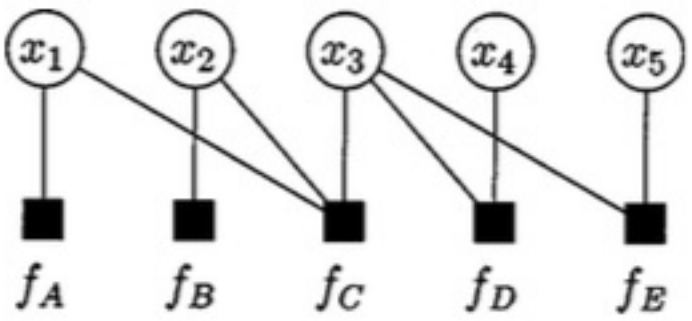

Figure 1: Fig. 1. A factor graph for the product

Frank R [2] introduce an approach to compute all marginal function, he refer to it as sum-product algorithm.

Plan for next week

- Read introductions of max-sum algorithm, which is used to solve $(Y^*, Z^*) = argmaxO(Y, Z|G, X, \alpha)$[1].
- Since factor graph seems like a method of classification, I will learn naive bayes and compare bayes with factor graph.

References

[1] Yuxiao Dong, Yang Yang, Jie Tang, Yang Yang, and Nitesh V Chawla. Inferring user demographics and social strategies in mobile social networks. In *Proceedings of the 20th ACM SIGKDD international conference on Knowledge discovery and data mining*, pages 15–24. ACM, 2014.

[2] Frank R Kschischang, Brendan J Frey, and H-A Loeliger. Factor graphs and the sum-product algorithm. *Information Theory, IEEE Transactions on*, 47(2):498–519, 2001.